



Douglas A. Ducey
Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY



Misael Cabrera
Director

via e-mail

April 3, 2019
FPU19-172

Ms. Catherine Jerrard
AFCEC/CIBW
706 Hangar Road
Rome, NY 13441

RE: WAFB – ADEQ Comments – *Draft, Soil Vapor Extraction System, Operation and Maintenance, 2017 First and Second Quarter Performance Report, Former Liquid Fuels Storage Area, Site ST012, Former Williams Air Force Base, Mesa, Arizona*; prepared for Air Force Civil Engineer Center (AFCEC/CIBW), Lackland AFB, TX; prepared by Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec), Phoenix, AZ; document dated February 15, 2019.

Dear Ms. Jerrard:

Arizona Department of Environmental Quality (ADEQ) Federal Projects Unit (FPU) and ADEQ contractor UXO Pro, Inc. reviewed the above referenced document. ADEQ's comments are provided below.

General Comments

- (1) ADEQ appreciates the information breadth and depth presented within the report. Please provide data evaluation in future quarterly performance reports. In general, the report contains a significant amount of data, but very little evaluation of that data. The results from Steam Enhanced Extraction (SEE), or even the conditions during the reporting period, are not discussed in relation to the implementation of Enhanced Bioremediation (EBR) or (future proposed) Monitored Natural Attenuation (MNA).

Specific Comments

1. Page 1-2, Section 1.2, Lines 178-184. Please edit the text to indicate all the cited depth intervals for the LPZ, LSZ, and underlying aquitard are approximate.
2. Page 1-3, Section 1.3, Line 204. Please insert a sentence summarizing the implementation dates for SEE.

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3. Table 2-2. Please confirm the estimated mass removed during the first quarter. The mass estimate could not be recreated using the equation provided in Appendix A (copied below). In particular, the masses removed during the first quarter may be higher, based on the equation in Appendix A and as illustrated in the table below.

$$\text{Average Mass Flow Rate (pounds per day [lbs/day])} = Q \times C \times MW \times (4.013 \times 10^{-6}) \times H_{\text{op}}/H_{\text{max}}$$

Where:

Q	= Flow rate (vacuum blower flow rate, standard cubic feet per minute [scfm])
C	= Vapor concentration (laboratory results, parts per million by volume [ppmv])
MW	= Molecular weight (grams per gram mole [g/gmol])
4.013×10^{-6}	= Constant ([gmol·min·lb]/[ppmv·ft ³ ·g·day])
$H_{\text{op}}/H_{\text{max}}$	= Hours system operated divided by total hours in the reporting period (hour per hour [hr/hr])

		Q1 Thermal	Q1 Flame	Q2 Thermal	Q2 Flame
Hrs. Operated		2321	2339	1739	2172
Hrs. in Period		2352	2352	2184	2184
Oxidizer Uptime		98.7%	99.4%	79.6%	99.5%
TPH	ppm	454	890	455	525
Q	scfm	326	646	348	673
TPH Mass Removed	lbs.	6,098	23,873	4,888	13,623

4. Table 2-2. Please explain why the thermal oxidizer operated at flows (~350 scfm) so far below the rated maximum flow of the unit (1,000 scfm)?
5. Page 2-9, Section 2.1.4, Line 472. Please edit to read, "... VOC treatment using an air stripper and ..."
6. Page 2-9, Section 2.1.4.
- Please include the approximate total volume of water processed through the groundwater treatment system and discharged during these two quarters.
 - Please identify where the vapors from the air stripper were routed and treated during the processing of water in the groundwater treatment system during these two quarters and discuss how this activity impacted the operation of the SVE system.
7. Table 2-7.
- Please provide consistent data for average VOC concentrations. With only one or two exceptions, the first quarter average VOC concentrations are based on the PID readings; whereas, the second quarter average VOC concentrations are based on the FID readings.
 - The reported average VOC concentrations for both the thermal and flame oxidizer effluents do not match the data provided in Table 2-6.
 - Please add a row for the average values measured at the Wellfield Influent.
 - How were Average CH₄ concentrations determined? Several values are reported as greater than 100 %LEL.

8. Page 2-23, Section 2.3.1, Line 679. Please edit to read, “This decrease that may ...”
9. Section 2.3.1. Please verify that the cited masses removed are correct, as commented on above regarding Table 2-2. The average TPH mass removal rates during the first quarter appear to be low.
10. Page 2-22, Section 2.3.2, Line 755. Please change 1.750 to 1,750.
11. Section 2.3.3. Please discuss limitations on increasing vapor flow from deep wells of the SVE system as the screen intervals (135-165 ft. bgs) are being submerged by the rising water table (139.28 to 149.28 ft. bgs in November 2016). A higher wellhead vacuum results in a local water level increase, further decreasing the open screen available for vapor extraction.
12. Page 3-2, Section 3.1.2, Lines 886-887. Based on Graph 3-2, LNAPL was pumped additionally from ST012-UWBZ10 during the reporting period but not from ST012-UWBZ06 as indicated in the text. Please correct the text or the graph as necessary.
13. Page 3-2, Section 3.1.2, Lines 888-889. Based on Graph 3-3, LNAPL was pumped additionally from W11 and W37 during the reporting period but not from wells ST012-LSZ38 and ST012-LSZ47 as indicated in the text. Please correct the text or the graph as necessary.
14. Page 3-19, Section 3.1.4.4. Please provide a brief discussion of results from groundwater analyses on samples collected at interior well locations, i.e., wells within the anticipated treatment zone of the steam enhanced extraction. Of particular interest are wells ST012-UWBZ11, a former steam injection well, with a detected benzene concentration of 1,500 mg/L on 4/21/2017 and ST012-LSZ42, located between former steam injection wells ST012-LSZ21 and ST012-LSZ26, with a detected benzene concentration of 1,600 mg/L on 4/24/2017.
15. Page 3-26, Section 3.3.1.1, Line 1043. The reported rise in water level during the period for well ST012-W38 appears to be in error, please correct the value.
16. Appendix B. How is the Average Combined Influent CH₄ content determined? If it is calculated and not measured, it is not necessary to report it. Similarly, it is not necessary to report the influent flowrate combined.
17. Analytical Data Validation Package 280-93397:
 - a. VOCs: The data validation report should include the laboratory control sample (LCS)/LCS duplicate relative percent difference (RPD) exceedances for cyclohexane and hexane. Cyclohexane was detected in two of the samples associated with this LCS and should be qualified as estimated (J): ST012-CZ23-WG-150.83-012517 and ST012-DUP02 (CZ23)-012517.
 - b. GRO: In section 7.0, the summary bullet states that no flags were applied due to surrogate recoveries. However, data were qualified due to surrogates as per Section 7.2. Please Correct.
 - c. Section 7.3: Change “VOCs” to “GRO”.
 - d. DRO: Section 8.1: Change “VOCs” to “DRO”.

18. Analytical Data Validation Package 280-93747:

- a. Section 6.4: The result for 1,2-dichloroethane was rejected in sample ST012-UWBZ40-WG-185-020617 due to a poor spectral match. However, it would be more appropriate to change this result to a non-detect in lieu of rejecting the result. It would be usable as a non-detect result.
- b. GRO: Please include a discussion in the data validation report on the GRO detected in one method blank at 0.0440 mg/L.
- c. The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the GRO analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified. Please add the appropriate qualification.

19. Analytical Data Validation Package 280-96167: Qualification schemes should be consistent between packages. For example, Section 6.2 sample results were qualified as estimated (J) due to MS/MSD recoveries. However, in another data validation report, results were qualified with an “M” due to MS/MSD recoveries.

20. Analytical Data Package 280-96249:

- a. VOCs: The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the VOC analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified.
- b. GRO: The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the GRO analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified.

21. Analytical Data Package 280-96361:

- a. VOCs: In section 6.0, the summary bullet states that no flags were applied due to blanks. However, data were qualified due to blanks as per Section 6.1.
- b. GRO: The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the GRO analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified.
- c. Anions: In section 9.0, the summary bullet states that no flags were applied due to blanks. However, data were qualified due to blanks as per Section 9.1.

22. Analytical Data Package 280-98170:

- a. VOCs: The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the VOC analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified.
- b. GRO: The data validation report states that no qualification was performed due to surrogate nonconformances because the sample was analyzed at a dilution. However, for the GRO analysis, surrogates are spiked in to the sample after the dilution has been performed and are therefore not affected by the dilution and should be qualified.

Closure

ADEQ may add or amend comments if evidence to the contrary of our understanding is discovered; if received information is determined to be inaccurate; if any condition was unknown to ADEQ at the time this document was submitted; if other parties bring valid concerns to our attention; or site conditions are deemed not protective of human health and the environment within the scope of this Department.

Thank you for the opportunity to comment. Should you have any questions regarding this correspondence, please contact me by phone at (602) 771-4121 or e-mail miller.wayne@azdeq.gov.

Sincerely,



Wayne Miller
ADEQ Project Manager, Federal Projects Unit
Remedial Projects Section, Waste Programs Division

cc:

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